

APPENDIX O
Endocrine Assessment

TABLE 0-1.
Dependent Variable-Covariate Associations for Endocrine Assessment

Dependent Variable	Level	Age			Race		
		Born >1942	Born 1923-1941	Born ≤1922	p-Value	Black	Nonblack
T_3 % Uptake (continuous) ^a (discrete)	High	(n=945)	(n=1,224) $r=-0.007$	(n=79)	0.752	(n=137) $\bar{x}=30.7$	(n=2,111) $\bar{x}=30.5$
		3.5%	3.7%	7.6%	0.179	4.4%	3.7%
TSH (continuous) ^b (discrete)	High	--	(n=1,864) $r=0.173$	--	<0.001	(n=110) $\bar{x}=0.87$	(n=1,754) $\bar{x}=1.00$
		(n=945)	(n=1,224)	(n=79)	0.236	(n=137) 0.7%	(n=2,111) 2.0%
FSH (continuous) ^a (discrete)	Low	(n=2,291) $r=0.281$			<0.001	(n=137) $\bar{x}=6.67$	(n=2,154) $\bar{x}=7.78$
		(n=956) 11.1%	(n=1,251) 6.3%	(n=84) 2.4%	<0.001	(n=137) 11.7%	(n=2,154) 7.9%
	High	(n=956) 4.7%	(n=1,251) 13.4%	(n=84) 33.3%	<0.001	(n=137) 11.0%	(n=2,154) 10.5%
Testosterone ^c (continuous) ^c (discrete)	Low	(n=955) $r=-0.293$	(n=1,242)	(n=84)	<0.001	(n=136) $\bar{x}=553.2$	(n=2,145) $\bar{x}=527.6$
		1.3%	1.7%	7.1%	<0.001	2.2%	1.7%
2-Hour Post-prandial Glucose (continuous) ^a (discrete)	Normal	(n=918) $r=0.191$	(n=1,125)	(n=70)	<0.001	(n=123) $\bar{x}=109.8$	(n=1,990) $\bar{x}=110.5$
		88.9%	78.3%	68.6%	<0.001	82.9%	82.6%
		9.3%	18.8%	30.0%		13.8%	15.1%
Composite Diabetes Indicator (discrete)	Yes	1.9%	2.8%	1.4%		3.3%	2.3%
		(n=950) 4.8%	(n=1,242) 11.8%	(n=83) 14.5%	<0.001	(n=137) 13.1%	(n=2,138) 8.7%

TABLE 0-1. (continued)

Dependent Variable-Covariate Associations for Endocrine Assessment

Dependent Variable	Level	Occupation			p-Value	Personality Type		p-Value
		Officer	Enlisted Flyer	Enlisted Groundcrew		Type A	Type B	
T_3 % Uptake (continuous) ^a (discrete)	High	(n=850) $\bar{x}=30.9$ 4.7%	(n=378) $\bar{x}=30.1$ 2.9%	(n=1,020) $\bar{x}=30.3$ 3.2%	<0.001 0.161	(n=938) $\bar{x}=30.5$ 3.7%	(n=1,197) $\bar{x}=30.5$ 3.8%	0.742 0.988
		(n=722) $\bar{x}=1.02$ (n=850)	(n=307) $\bar{x}=0.99$ (n=378)	(n=835) $\bar{x}=0.96$ (n=1,020)	0.062 0.369	(n=777) $\bar{x}=1.00$ (n=938)	(n=998) $\bar{x}=0.98$ (n=1,197)	0.390 0.999
TSH (continuous) ^b (discrete)	High	(n=873) $\bar{x}=8.25$ (n=873) 6.8%	(n=383) $\bar{x}=7.99$ (n=383) 7.3%	(n=1,035) $\bar{x}=7.18$ (n=1,035) 9.7%	<0.001 0.056	-- --	-- --	-- --
		(n=873) 13.3%	(n=383) 11.8%	(n=1,035) 7.7%	<0.001	-- --	-- --	-- --
FSH (continuous) ^a (discrete)	Low	(n=873) $\bar{x}=8.25$ (n=873) 6.8%	(n=383) $\bar{x}=7.99$ (n=383) 7.3%	(n=1,035) $\bar{x}=7.18$ (n=1,035) 9.7%	<0.001 0.056	-- --	-- --	-- --
		(n=873) 13.3%	(n=383) 11.8%	(n=1,035) 7.7%	<0.001	-- --	-- --	-- --
$Testosterone$ (continuous) ^c (discrete)	Low	(n=869) $\bar{x}=504.4$ 2.1%	(n=381) $\bar{x}=529.6$ 1.8%	(n=1,031) $\bar{x}=550.3$ 1.4%	<0.001 0.479	(n=948) $\bar{x}=537.6$ 1.3%	(n=1,216) $\bar{x}=522.5$ 2.1%	0.031 0.214
		(n=806) 84.4%	(n=355) 77.7%	(n=952) 82.9%	0.024 0.004	(n=884) 84.6%	(n=1,116) 80.6%	0.004 0.051
2-Hour Post-prandial Glucose (continuous) ^a (discrete)	Normal Impaired Diabetic	(n=806) 14.1%	(n=355) 20.3%	(n=952) 13.9%	0.024 0.004	(n=884) 13.1%	(n=1,116) 17.0%	0.004 0.051
		(n=806) 1.5%	(n=355) 2.0%	(n=952) 3.3%		(n=884) 2.3%	(n=1,116) 2.4%	
Composite Diabetes Indicator	Yes	(n=869) 8.2%	(n=382) 8.6%	(n=1,025) 9.9%	0.423	(n=949) 9.0%	(n=1,209) 9.3%	0.816

TABLE 0-1. (continued)
Dependent Variable-Covariate Associations for Endocrine Assessment

Dependent Variable	Level	Percent Body Fat			p-Value
		Normal/Lean	Obese		
T_3 , % Uptake (continuous) ^a (discrete)	High	--	--		--
		--	--		--
		--	--		--
TSH (continuous) ^b (discrete)	High	--	--		--
		--	--		--
		--	--		--
FSH (continuous) ^a (discrete)	Low	--	--		--
		--	--		--
	High	--	--		--
		--	--		--
Testosterone (continuous) ^c (discrete)	Low	(n=1,804) (n=477)			
		$r=-0.366$			<0.001
		1.1%	4.2%		<0.001
2-Hour Post-prandial Glucose (continuous) ^a (discrete)		(n=1,708) (n=405)			
		$r=0.303$			<0.001
		85.8%	68.9%		<0.001
		12.8%	24.4%		
		1.4%	6.7%		
Composite Diabetes Indicator	Yes	(n=1,802) (n=473)			
		6.0%	20.3%		<0.001

^aTransformed from natural logarithm (log) scale.

^bTransformed from log (X-0.4) scale; statistics based only on TSH values at or above detection limit of 0.5 μ IU/ml.

^cTransformed from square root scale.

--Correlations (r) are based on total sample and are not category specific; covariate not investigated for dependent variable.

TABLE 0-2.
Summary of Group-by-Covariate Interactions for Endocrine Variables

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand	Comparison		
Testosterone	Group-by-Occupation	Officer	n	374	495		
			Number/%				
			Low	7 1.9%	11 2.2%	0.86 (0.32,2.32) ^a	0.765 ^a
	Enlisted Flyer	Enlisted Flyer	n	166	200		
			Number/%				
			Low	5 3.0%	2 1.0%	2.81 (0.48,16.32) ^b	0.234 ^b
	Enlisted Groundcrew	Enlisted Groundcrew	n	425	554		
			Number/%				
			Low	7 1.6%	7 1.3%	****	****
			Normal	418 98.4%	547 98.7%		

TABLE 0-2. (continued)
Summary of Group-by-Covariate Interactions for Endocrine Variables

Variable	Interaction	Stratification	Statistic	Group				Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand	Comparison				
Testosterone (Enlisted Groundcrew)	Group-by- Age	Born \geq1942 Type A	n Number/%	125		158			
			Low	2	1.6%	2	1.3%	1.27 (0.18,9.13) ^c	0.999 ^c
	Group-by- Personality Type	Born 1923-1941 Type A	n Number/%	123	98.4%	156	98.7%		
			Low	2	4.5%	0	0.0%	--	0.278 ^c
	Born \leq1922 Type A		n Number/%	44		73			
			Low	2	4.5%	0	0.0%	--	--
	Born \geq1942 Type B		n Number/%	42	95.5%	73	100.0%		
			Low	1	0.0%	3		--	--
	Born 1923-1941 Type B		n Number/%	152		203		--	0.372 ^c
			Low	0	0.0%	3	1.5%		
	Born \leq1922 Type B		n Number/%	152	100.0%	200	98.5%	--	0.554 ^c
			Low	93	100.0%	104			
	Born \geq1942 Type B		n Number/%	93		2	1.9%	--	0.136 ^c
			Low	93	100.0%	102	98.1%		
	Born 1923-1941 Type B		n Number/%	10		13		--	--
			Low	3	30.0%	0	0.0%		
			Normal	7	70.0%	13	100.0%		

TABLE 0-2. (continued)
Summary of Group-by-Covariate Interactions for Endocrine Variables

Variable	Interaction	Stratification	Statistic	Group		Adj. Relative Risk (95% C.I.)	p-Value
				Ranch Hand	Comparison		
Composite Diabetes Indicator	Group-by-Percent Body Fat	Normal/Lean	n	797	1,005		
			Number/%				
		Yes	56	7.0%	53	5.3%	1.40 (0.94,2.09)
	Obese	No	741	93.0%	952	94.7%	0.093
		n	190	283			
		Number/%					
	Yes	36	18.9%	60	21.2%	0.82 (0.51,1.31)	0.405
	No	154	81.1%	223	78.8%		

^aRelative risk, confidence interval, and p-value based on model adjusted for age and percent body fat.

^bRelative risk, confidence interval, and p-value based on model adjusted for percent body fat and personality type.

^{****}Group-by-age interaction ($p \leq 0.01$) and group-by-personality type interaction ($0.01 < p \leq 0.05$)--adjusted relative risk and p-value not presented.

^cUnadjusted relative risk and p-value based on stratified table.

--Relative risk/confidence interval/p-value not given due to cells with zero frequency.

Note: Refer to Table 18-5 for specification of adjusted models.

TABLE 0-3.
Exposure Index-by-Covariate Interactions for Endocrine Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index			Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low	Medium	High			
T_3 % Uptake	Exposure Index-by- Race (Officer)	Nonblack	n	119	112	113	M vs. L H vs. L	— —	0.446 0.385
			Adj. Mean ^a	30.8	31.1	30.5			
		Black	n	2	3	2	M vs. L H vs. L	— —	0.008 0.055
	Composite Diabetes Indicator	Nonblack Type A	Adj. Mean ^a	35.5	28.9	30.2	M vs. L H vs. L	— —	0.008 0.055
			95% C.I. ^a	(30.4,31.3)	(30.6,31.6)	(30.1,31.0)			
		Black Type A	n	26	17	22	Overall	—	0.002
Ω	Exposure Index-by- Personality Type (Enlisted Flyer)	Nonblack Type A	n	0	4	0	M vs. L H vs. L	— —	0.039 —
			Number/%	0.0%	23.5%	0.0%			
			Yes No	26 100.0%	13 76.5%	22 100.0%	H vs. L	—	—
		Black Type A	n	1	0	2	Overall	—	—
			Number/%	0.0%	—	0.0%	M vs. L H vs. L	— —	—
			Yes No	0 1 100.0%	0 —	2 100.0%	H vs. L	—	—
	Nonblack Type B	n	26	42	26	Overall	—	0.197	
		Number/%	3.8%	14.3%	3.8%	M vs. L H vs. L	4.17 (0.47,36.77) 1.00 (0.06,16.89)	0.338 0.999	
			Yes No	1 25 96.2%	6 36 85.7%	25 0 0.0%	H vs. L	—	—
	Black Type B	n	0	4	1	Overall	—	—	
		Number/%	—	0.0%	100.0%	M vs. L H vs. L	— —	—	
			Yes No	0 0 —	4 4 100.0%	0 0 0.0%	H vs. L	—	—

TABLE 0-3. (continued)
Exposure Index-by-Covariate Interactions for Endocrine Variables

Variable	Interaction (Occupation)	Stratification	Statistic	Exposure Index						Exposure Index Contrast	Adj. Relative Risk (95% C.I.)	p-Value
				Low		Medium		High				
Composite Diabetes Indicator	Exposure Index-by-Percent Body Fat (Enlisted Groundcrew)	Normal/Lean	n	111		122		101		Overall		0.926
			Number/%		8	7.2%	8	6.6%	8	7.9%	M vs. L	0.90 (0.33,2.49)
		Obese	Yes	103	92.8%	114	93.4%	93	92.1%	H vs. L	1.11 (0.40,3.07)	0.999
			No							Overall		0.046
	T ₃ % Uptake	Normal/Lean	n	31		27		32		Overall		
			Number/%		2	6.5%	6	22.2%	10	31.3%	M vs. L	4.14 (0.76,22.59)
		Obese	Yes	29	93.5%	21	77.8%	22	68.7%	H vs. L	6.59 (1.31,33.18)	0.026
			No									

*Adjusted relative risk not applicable for T₃ % Uptake. Percentages not given due to zero participants for a particular exposure index classification. Relative risk/confidence interval/p-value not given due to cells with zero frequency.

*Transformed from natural logarithm scale.

Notes: Relative risks/confidence intervals and p-values for composite diabetes indicator based on stratified, unadjusted analyses. Adjusted means/confidence intervals and p-values for T₃ % Uptake based on adjusted analyses. Small sample sizes may affect validity of overall p-value.